

An overview of conventional and surface free energy methods used to determine asphalt aggregate adhesion

ABSTRACT

Asphalt aggregate adhesion strength is the fundamental property that determines the moisture damage of asphalt pavement. Moisture damage is related to loss of stiffness or strength as a result of cohesive and adhesive failure of the pavement material. The conventional test for asphalt aggregate adhesion is only comparative and does not provide a quantitative value. Currently research is being carried out to introduce surface free energy measurements as fundamental means to quantify asphalt aggregate adhesion and cohesion. Some of the methods developed to measure surface free energy are Sessile Drop Method, Wilhelmy Plate Method, Adsorption Method, Inverse Gas Chromatography, and Micro-calorimeter. This could eventually lead to the development of a cost effective, accurate and reliable surface free energy measurement instrument which can be used by field engineers.

Keyword: Adhesion; Surface free energy; Moisture damage; Cohesion